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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/070,603	06/24/2002	Reinhold Noe	112740-533	7652
29177	7590	10/24/2005	EXAMINER	
BELL, BOYD & LLOYD, LLC			MALKOWSKI, KENNETH J	
P. O. BOX 1135			ART UNIT	
CHICAGO, IL 60690-1135			PAPER NUMBER	
			2633	

DATE MAILED: 10/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/070,603	NOE, REINHOLD	
	Examiner	Art Unit	
	Kenneth J. Malkowski	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 June 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 32-62 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>5/27/2003</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 32-62 are rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent No. 6,130,766 to Cao et al.

With respect to claims 32 and 47, Cao discloses a system for optical information transmission (column 3 lines 8-11) having differently polarized optical signal elements (column 3 lines 19-23 (principal states of polarization)), comprising: a controllable polarizing element (column 1 lines 55-56) Figure 1 (22) for emitting at least one of the optical signal elements on an output side Figure 1 (24, 29); at least one signal processing module (column 6 line 32 (digital signal processing unit)) Figure 1 (30) for detecting any interference occurring between the optical signal elements (column 6 lines 30-40).

With respect to claims 33 and 48, Cao discloses a system for optical information transmission as claimed in claim 32, further comprising, in the at least one signal processing module Figure 1 (30)(DSP control unit), at least one regulator Figure 1 (28) having at least one input-side control signal Figure 1 (27) at an input of the regulator,

and at least one output-side control signal at an output of the regulator, the output-side control signal being passed by the regulator to the controllable polarizing element Figure 1 (22). Applicant describes regulators as elements wherein control signals assume minimum magnitudes to ensure optimum receiver operation (page 11 lines 8-11 of applicants specification). Cao teaches the driver Figure 1 (28) also is controlled in such a way so as to minimize the amplitude of the control signal entering the controllable polarizing element Figure 1 (22) (column 8 lines 48-59).

With respect to claims 34-35 and 49-50 Cao discloses a system for optical transmission as claimed in claim 32, further comprising, in the controllable polarizing element Figure 1 (24), a controllable polarization transformer (applicant describes a controllable polarization transformer as a PMD compensator on page 7 lines 28-30 of applicants' specification)(column 1 lines 55-57) followed by a fixed polarizing element Figure 1 (24)(polarization beam splitter)(column 3 lines 38-56).

With respect to claims 36-37 and 51-53 Cao discloses a system for optical information transmission as claimed in claim 32, further comprising a phase-difference modulating device for producing differential phase modulation between signal elements (column 2 lines 30-33)(column 1 lines 60-65)(column 6 lines 26-40 (wherein the input side control signal is not associated with a steady state difference phase angle)).

With respect to claims 38 and 54 Cao discloses a system for optical transmission as claimed in claim 36, further comprising a transmission laser and a transmission-end power splitter Figure 1 (24), wherein the phase-difference modulating device produces frequency modulation on the transmission laser (column 6 lines 26-40 (frequency of the

transmitted optical signal is associated with each principal state of polarization which is altered by the phase difference modulating device)), and produces the differential phase modulation between the optical signal elements based on a magnitude of any delay time difference between a splitting of an optical from the transmission laser in the transmission-end power splitter Figure 2 (incoming line called "from PBS 24" enters block 30a)) and combination with orthogonal polarizations of the optical signal elements formed in this way (column 3 lines 8-31).

With respect to claims 39 and 55, Cao discloses a system for optical information transmission as claimed in claim 32, further comprising at least one photo detector following the controllable polarizing element Figure 2 (68), wherein a signal component which is emitted on the output side of the controllable polarizing element is supplied to an input side of the at least one photo detector Figure 2 (68), the at least one photo detector producing at least one detected signal in which interference is manifested (column 7 lines 1-8).

With respect to claims 40 and 56, Cao discloses a system for optical information transmission as claimed in claim 39, further comprising a filter in the at least one signal which can be processed and is produced from the at least one detected signal (column 8 lines 6-17).

With respect to claims 41-43 and 57-59, Cao discloses a system for optical information transmission as claimed in claim 39, further comprising a detector Figure 2 (60,68) in the at least one signal processing module Figure 1 (30) Figure 2 (30a) which at least partially provides the input-side control signal Figure 2 which is one of a linear

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function and a splitter root function of at least one second-order moment of at least one spectral signal element (column 3 lines 23-27 (wherein two spectral elements, the first and second PSP's are linearly polarized)). Furthermore, because a second-order moment is a measure of power of the spectral component, Cao teaches discloses a detector that fulfills such a requirement (column 7 lines 1-8).

With respect to claims 44 and 60, Cao discloses a system for optical information transmission as claimed in claim 40, wherein the filter passes a Fourier coefficient of a signal Figure 2 (column 8 lines 4-21)(column 8 lines 31-36 (wherein  $A$  from  $A \sin(2\omega t + \theta)$  is a Fourier coefficient)), which can be processed, as a spectral signal element Figure 1 (30), Figure 2 (30a)(column 8 lines 25-30) in which case delay time compensation can be effected before formation of second moments in mixed form (column 8 lines 26-55 (the process of implementing a DSP algorithm)).

With respect to claims 45 and 61, Cao discloses a system for optical information transmission as claimed in claim 40, wherein the at least one signal processing module Figure 1 (30), Figure 2 (30a) processes the at least one detected signal Figure 2 (from TAP 20 and from PBS 24) and emits an output-side control signal which drives Figure 2 (27) an output side polarization transformer in the controllable polarizing element Figure 1 (22)

With respect to claims 46 and 62, Cao discloses a system for optical information transmission as claimed in claim 40, further comprising a correlating element in the at least one signal processing module, the correlating element for correlating the at least one detected signal with at least one spectral component of at least one data output

signal (column 2 lines 3-5), and for emitting a correlation signal which can be processed, such that the at least one signal processing module processes the correlation signal Figure 2 column 4 lines 37-40) and emits and output side control signal Figure 1 (27) for driving an input-side polarization transformer Figure 1 (27) in the controllable polarizing element (column 3 lines 8-37).

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to polarization related transmission systems in general:

U.S. Patent No. 6,104,515 is cited to show a method and apparatus for providing high-order polarization mode dispersion compensation using temporal imaging

U.S. Patent No. 6,901,225 is cited to show a device for detecting polarization mode dispersions

U.S. Patent No. 6,714,742 is cited to show a polarization-division multiplexing based on power encoding of different polarization channels


U.S. Patent No. 5,822,100 is cited to show a method and system for equalizing PMD using incremental delay switching

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Malkowski whose telephone number is (571) 272-5505. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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